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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,972	10/05/2001	Raj Subbu	H26-073 US	5708

21706 7590 03/29/2004  
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EXAMINER

HIRL, JOSEPH P

ART UNIT PAPER NUMBER

2121

DATE MAILED: 03/29/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

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# Office Action Summary

Application No.

09/971,972

Applicant(s)

SUBBU ET AL.

Examiner

Joseph P. Hirl

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This Office Action is in response to an AMENDMENT entered January 15, 2004 for the patent application 09/971,972 filed on October 5, 2001.

2. The First Office Action of November 17, 2003 is fully incorporated into this Final Office Action by reference.

3. The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

4. Examiner's Opinion:

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. New matter has been added in the form of "cooperative" coevolutionary agents.

***Status of Claims***

5. Claims 1, 3, 5 and 7 are amended. Claims 9-16 are new. Claims 1-16 are pending.

***Title Objection***

6. The title is objected to because it contains the word "cooperative" which represents "new matter."

This objection must be corrected.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

9. Applicant is silent on cooperative coevolutionary agents in the abstract.

Applicant is silent on cooperative coevolutionary agents in the Summary of the Invention (paras 0034-0038). Applicant is silent on cooperative coevolutionary agents in the Description of the Preferred Embodiments (paras 0043-0088) with the exception of para 0049 which states:

The local search phase and intercommunication phases are alternated to produce a cooperative search by nodes 20a-20d, guided by the same objective search function.

10. From para 0045, the applicant notes that coevolutionary agents are spread among several nodes 20a, 20b, 20c, 20d. As one of ordinary skill in the art knows, nodes, as defined by the applicant, don't produce a cooperative search. **Simply stated, the applicant did not disclose in the specification the intention to implement cooperative coevolutionary agents.**

### ***Response to Arguments***

11. Applicant's arguments filed on November 17, 2003 related to Claims 1-16 have been fully considered but are not persuasive.

In reference to Applicant's argument:

Initially, applicants wish to point out that the method and system of Seredynski utilizes a competitive coevolutionary algorithm (see p. 432, col. 2, lines 16-21), rather than a cooperative co-evolutionary algorithm as now recited in the independent claims. The algorithm of Seredynski is based on game theory models of interaction, which are by definition, competitive. Applicants observe that competitive and cooperative systems and methods are viewed as distinctly different: approaches by those of ordinary skill in the art of the invention. And, Seredynski notes that others have proposed cooperative approaches, but

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he discards cooperative approaches as unacceptable compared to the competitive approach described in the article. See p. 432, col. 2, text following heading B.

**Examiner's response:**

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. Applicant is silent on cooperative coevolutionary agents in the abstract. Applicant is silent on cooperative coevolutionary agents in the Summary of the Invention (paras 0034-0038). Applicant is silent on cooperative coevolutionary agents in the Description of the Preferred Embodiments (paras 0043-0088) with the exception of para 0049 which states:

The local search phase and intercommunication phases are alternated to produce a cooperative search by nodes 20a-20d, guided by the same objective search function.

From para 0045, the applicant notes that coevolutionary agents are spread among several nodes 20a, 20b, 20c, 20d. As one of ordinary skill in the art knows, nodes, as defined by the applicant, don't produce a cooperative search. Simply stated, the applicant did not disclose in specification the intention to implement cooperative coevolutionary agents. Hence the comments made by the applicant related to the prior art of Seredynski are moot.

**In reference to Applicant's argument:**

A second important distinction between Seredynski and the claimed invention is that Seredynski uses competitive game theory to produce solutions that generate payoffs based on a determination of the quality of the solution. The agents in Seredynski share payoff information to affect current payoffs at other nodes. In contrast, the method and system of the invention shares decision information: in the form of solutions, between agents. Sharing the decision information does not affect current solutions; rather, future decisions and solutions are affected. The claimed method permits near instantaneous receipt of global feedback at each node as a result of sending decision information between nodes. At the same time, the locally obtained solutions are used individually by each agent to update the cooperative

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coevolutionary agent. That is, the current outcome is not affected by the updating or decision-making in the claimed invention, while in Seredynski, it is.

Further, in the claimed invention, the decision information is shared according to a selected coordination scheme. The coordination schemes are all based on explicitly using global performance of the distributed agents. Seredynski, in comparison, only observes the global performance, but does not use the global performance of its agents to affect any decision-making.

Seredynski provides a system for agents to share payoff information according to a local or global scheme, and may compute a local payoff based on a locally defined function. The current payoff is a temporary solution, however, and is modified by information about other payoffs. The claimed method and system, however, give a mechanism to each coevolutionary agent in the form of the mobile agents, for immediately computing global payoffs at each node. That is, each agent receives its global performance as feedback via the mobile agents. At the same time, the freedom of the coevolutionary agents is restricted to the use of the primary search variable for the agent.

Examiner's response:

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. The Examiner's perspective is from the applicant's claims. Comments related to specification differences that are not specifically manifest in the applicant's claims are moot.

In reference to Applicant's argument:

Seredynski does not provide for any interaction with network-distributed databases for retrieving information. The coevolutionary architecture of the method and system of the invention, however, utilizes a database which is spread across the network, with each agent having access to a local portion of the distributed database. This feature is recited in each independent claim.

Examiner's response:

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. The referenced feature concerning databases is contained in the preamble and not in the body of the independent claims. However, the applicant's spreading across the network is limited to at least two nodes. Seredynski is

interested in global behavior of team players taking part in iterated games (Seredynski, p 432, c 2, l 10-13). To one of ordinary skill in the art, Seredynski therefore has a distributed database.

**In reference to Applicant's argument:**

These differences cause the Seredynski system to produce a more limited set of optimized solutions than the one claimed by applicants. Seredynski is useful only in applications having favorable objective {payoff function} properties, and particularly, additively decomposable objectives where optimizing on localized views will still help from a global perspective, and problems where coupling between nodes is non-existent or at best, minimal. The claimed invention, in contrast, can be used to solve problems having a high degree of coupling or complex non-linearities. The claimed invention is not subject to the problem of having to a priori determine globally consistent, localized payoff functions or unreasonably assuming that coupling does not exist in the problem being solved.

These distinctions are found in each of the four independent claims now in the case -claims 1, 5, 9 and 13.

**Examiner's response:**

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. Seredynski anticipates the applicant's invention.

**In reference to Applicant's argument:**

In particular, in claims 4, 8, 11, 12, 15 and 16, alternate ones of specific schemes for coordinating the actions of the mobile agents are recited. None of these schemes are disclosed in Seredynski; the referenced section does not mention any one of these schemes.

**Examiner's response:**

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. Seredynski anticipates the applicant's invention.

**In reference to Applicant's argument:**

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Considering the several differences between applicants' claimed invention and the method described in Seredynski, it is apparent that two clearly different methods are claimed and described, respectively. The Seredynski method has different steps and provides results in a different manner than the claimed invention, most notably by using competitive agents rather than cooperative agents.

Examiner's response:

Para 3 above applies. The claims and only the claims form the metes and bounds of the invention. Examiner has full latitude to interpret each claim in the broadest reasonable sense. The concept of cooperative agents is new matter. Seredynski anticipates the applicant's invention.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Seredynski et al (IEEE 0-7803-3104-4 referred to as **Seredynski**).

***Claim 1***

Seredynski anticipates providing an optimization algorithm (**Seredynski**, pg 432, c 2, l 16-21); creating a plurality of coevolutionary agents implementing the optimization algorithm, each coevolutionary Agent having a primary search variable and at least one secondary search variable, the plurality of coevolutionary agents distributed across the at least two nodes in the network architecture and the primary search variable of each coevolutionary agent corresponding to one of the at least one secondary search variables of the remaining coevolutionary agents (**Seredynski**, pg 432, c 2, l 16-21; pg

435, c 1, l 42-43; pg 433, c 2, l 14-25); conducting concurrent local searches using each coevolutionary agent at the corresponding one of the nodes where the coevolutionary agent is located, based on the primary search variable of the coevolutionary agent for producing local solutions using information available from the corresponding one of the local databases (**Seredynski**, pg 432, c 2, l 16-21; pg 435, c 1, l 42-43; pg 433, c 2, l 14-25); updating the primary search variable of each coevolutionary agent based on the corresponding one of the local solutions (**Seredynski**, pg 434, c 1, l 1-19; pg 433, c 2, l 26-30); providing a plurality of mobile agents at the at least two nodes (**Seredynski**, pg 434, c 1, l 1-19; pg 433, c 2, l 26-30); using the plurality of mobile agents to transport the local solutions produced at each node having a coevolutionary agent to all of the other nodes (**Seredynski**, pg 434, c 2, l 5-12); and updating the at least one secondary search variable of each coevolutionary agent using local solutions transported by the mobile agents using a coordination scheme (**Seredynski**, pg 434, c 1, l 7-10).

***Claims 2, 6***

Seredynski anticipates repeating conducting concurrent searches, updating the primary search variable, using the mobile agents to transport local solutions and updating the at least one secondary search variable to produce an optimized solution (**Seredynski**, pg 434, c 1, l 18-19).

***Claims 3, 7***

Seredynski anticipates accessing the optimized solution at any one of the at least one nodes (**Seredynski**, pg 434, c 1, l 1-30).

**Claims 4, 8**

Seredynski anticipates the coordination scheme is selected from the group consisting of local, joint, pool, elite local, elite joint and elite pool schemes (**Seredynski**, pg 432, c 2, l 3-10).

**Claim 5**

Seredynski anticipates providing an optimization algorithm relating the multiple interdependent variables (**Seredynski**, pg 432, c 2, l 3-16; pg 432, c 2, l 16-21); creating a plurality of coevolutionary agents implementing the optimization algorithm, each coevolutionary agent setting one of the multiple interdependent variables as a primary search variable, the rest of the interdependent variables being defined as secondary search variables for the coevolutionary agent (**Seredynski**, pg 432, c 2, l 16-21; pg 435, c 1, l 42-43; pg 433, c 2, l 14-25); distributing the plurality of coevolutionary agents across the plurality of nodes (**Seredynski**, pg 435, c 1, l 42-43); conducting concurrent local searches using each coevolutionary agent at the corresponding one of the nodes where the coevolutionary agent is located, based on the primary search variable of the coevolutionary agent for producing local solutions from information available from the corresponding one of the local databases (**Seredynski**, pg 432, c 2, l 16-21; pg 435, c 1, l 42-43; pg 433, c 2, l 14-25); updating the primary search variable of each coevolutionary agent based on the corresponding one of the local solutions (**Seredynski**, pg 434, c 1, l 1-19; pg 433, c 2, l 26-30); providing a plurality of mobile agents in the network-distributed environment (**Seredynski**, pg 434, c 1, l 1-19; pg 433, c 2, l 26-30); using the plurality of mobile agents to transport the local solutions

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produced at each node having a coevolutionary agent to all of the other nodes (Seredynski, pg 434, c 2, l 5-12); and updating the at least one secondary search variable of each coevolutionary agent using local solutions transported by the mobile agents using a coordination scheme (Seredynski, pg 434, c 1, l 7-10).

Examiner's Note: New claims 9-16 are similar to the preceding claims and Seredynski appropriately applies. Notwithstanding Seredynski's anticipation, Claims 9-16 are not recorded here since as noted above, they bear on new matter.

#### **Conclusion**

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

15. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

16. Claims 1-16 are rejected.

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***Correspondence Information***

17. Any inquiry concerning this information or related to the subject disclosure should be directed to the Examiner, Joseph P. Hirl, whose telephone number is (703) 305-1668. The Examiner can be reached on Monday – Thursday from 6:00 a.m. to 4:30 p.m.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Anil Khatri can be reached at (703) 305-0282.

Any response to this office action should be mailed to:

Commissioner of Patents and Trademarks,

Washington, D. C. 20231;

or faxed to:

(703) 746-7239 (for formal communications intended for entry);

or faxed to:

(703) 746-7290 (for informal or draft communications with notation of "Proposed" or "Draft" for the desk of the Examiner).

Hand-delivered responses should be brought to:


Receptionist, Crystal Park II

2121 Crystal Drive,

Arlington, Virginia.

  
Joseph P. Hirl

March 23, 2004

  
**GEORGE B. DAVIS**  
**PRIMARY EXAMINER**